INTRODUCTION CHAPTER 1

1.1 Background

A major goal of the Oil Pollution Act of 1990 (OPA)[1] is to make the environment and public whole for injury to or loss of natural resources and services as a result of a discharge or substantial threat of a discharge of oil (referred to as an *incident*). This goal is achieved through returning injured natural resources and services to the condition they would have been in if the incident had not occurred (otherwise referred to as *baseline* conditions), and compensating for interim losses from the date of the incident until recovery of such natural resources and services through the restoration, rehabilitation, replacement, or acquisition of equivalent natural resources and/or services.

The U.S. Department of Commerce, acting through the National Oceanic and Atmospheric Administration (NOAA), issued final regulations providing an approach that public officials (trustees) may use when conducting Natural Resource Damage Assessments (NRDA) under OPA.[2] These NRDA regulations (the OPA regulations) describe a process by which trustees may:

- Identify injuries to natural resources and services resulting from an incident;
- Provide for the return of injured natural resources and services to baseline conditions and compensation for interim lost services; and
- Encourage and facilitate public involvement in the restoration process.

The OPA regulations are included in Appendix A of this document for reference. The preamble discussion of the OPA regulations, along with a summary of and response to public comments received on the proposed regulations, is published at 61 Fed. Reg. 440 (January 5, 1996).

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1 33 U.S.C. §§ 2701 *et seq.*

2 The OPA regulations are codified at 15 CFR part 990 and became effective February 5, 1996.

1.2 Purpose and Scope of this Document

NOAA first proposed the OPA regulations on January 7, 1994 (59 Fed. Reg. 1062). The 1994 proposed OPA regulations offered a range of natural resource damage assessment procedures varying in levels of complexity and degree of site-specific application. Those proposed regulations included a compensation formula that could be used for small oil spills in estuarine and marine environments. The compensation formula was the simplest of a series of assessment procedures in the 1994 proposed OPA regulations. The purpose of the formula was for trustees to be able to readily estimate damages based on the amount of oil spilled and several simple data inputs.

The 1994 compensation formula was developed using a computer model promulgated by the Department of the Interior (DOI) under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA). One simplified procedure currently codified in the CERCLA rule is the Natural Resource Damage Assessment Model for Coastal and Marine Environments (NRDAM/CME), Version 2.4, which gives an estimate of *average* damages expected to result from minor discharges of oil and releases of hazardous substances occurring in the coastal and marine environment (61 Federal Register 20560, May 7, 1996). Also, DOI has developed a simplified assessment procedure for use in the Great Lakes known as the Natural Resource Damage Assessment Model for Great Lakes Environments (NRDAM/GLE), Version 1.4 (61 Federal Register 20560, May 7, 1996).

This document outlines the matrix of model runs used to derive the January 1994 compensation formula. The purpose is to allow these runs to be made using Version 2.4 of the NRDAM/CME. This will allow evaluation of how the compensation formula would change from that proposed in January 1994 and provide approximate estimates of damages for hypothetical spills based on the formula. This document does <u>not</u> include consideration of the freshwater environments.

Using the guidance and data in this document, trustees will have a simplified, cost-effective tool to use in estimating expected impacts of most discharges of oil. In order to use this guidance, trustees must have the final computer model developed by DOI. The NRDAM/CME, Version 2.4, is available from the National Technical Information Service, 5285 Port Royal Rd., Springfield, VA 22161; PB96-501788; (703) 487-4650.

The technical documentation for Version 2.4 of the current NRDAM/CME provides a full description of the model algorithms, assumptions, and underlying databases. This document lists only those data required as user inputs for runs that represent those used in the 1994 compensation formula. Reference will be made below to the NRDAM/CME, Version 2.4, documentation as to where data and sources may be found that are relevant to runs usable for the compensation formula. Refer to Appendix B for a listing of other related guidance documents in support of the OPA regulations.

1.3 Intended Audience

This document was prepared primarily to provide guidance to natural resource trustees using the OPA regulations. However, other interested persons may also find the information contained in this document useful and are encouraged to use this information as appropriate.

1.4 The NRDA Process

The NRDA process shown in Exhibit 1.1 in the OPA regulations includes three phases outlined below: Preassessment; Restoration Planning; and Restoration Implementation.

1.4.1 Preassessment Phase

The purpose of the Preassessment Phase is to determine if trustees have the jurisdiction to pursue restoration under OPA, and, if so, whether it is appropriate to do so. This preliminary phase begins when the trustees are notified of the incident by response agencies or other persons.

Once notified of an incident, trustees must first determine the threshold criteria that provide their authority to initiate the NRDA process, such as applicability of OPA and potential for injury to natural resources under their trusteeship. Based on early available information, trustees make a preliminary determination whether natural resources or services have been injured. Through coordination with response agencies, trustees next determine whether response actions will eliminate the threat of ongoing injury. If injuries are expected to continue, and feasible restoration alternatives exist to address such injuries, trustees may proceed with the NRDA process.

1.4.2 Restoration Planning Phase

The purpose of the Restoration Planning Phase is to evaluate potential injuries to natural resources and services and use that information to determine the need for and scale of restoration actions. The Restoration Planning Phase provides the link between injury and restoration. The Restoration Planning Phase has two basic components: injury assessment and restoration selection.

NATURAL RESOURCE DAMAGE ASSESSMENT
Oil Pollution Act of 1990
Overview of Process

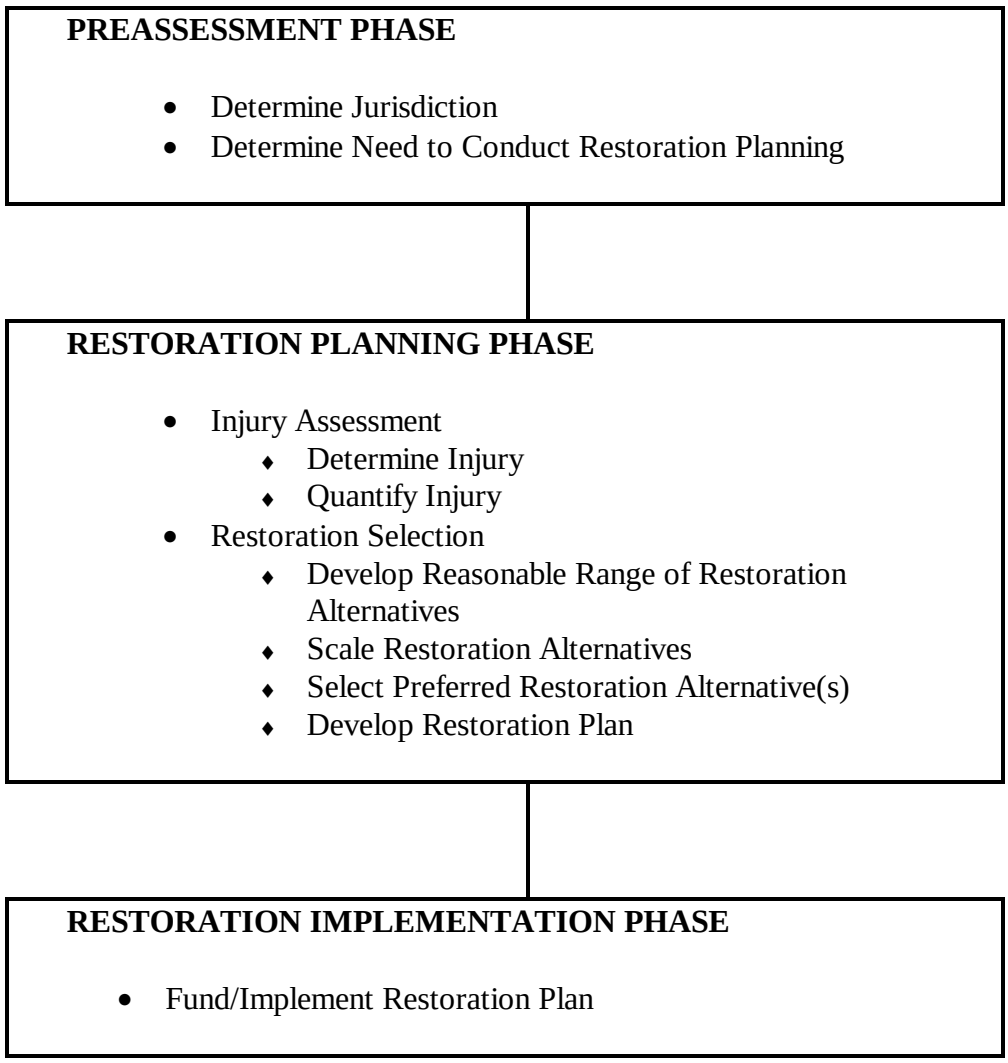

Exhibit 1.1 NRDA process under the OPA regulations.

1.4.2.1 Injury Assessment

The goal of injury assessment is to determine the nature, degree, and extent of any injuries to natural resources and services. This information is necessary to provide a technical basis for evaluating the need for, type of, and scale of restoration actions. Under the OPA regulations, injury is defined as an observable or measurable adverse change in a natural resource or impairment of a natural resource service. Trustees determine whether there is:

- Exposure, a pathway, and an adverse change to a natural resource or service as a result of an actual discharge; or

- An injury to a natural resource or impairment of a natural resource service as a result of response actions or a substantial threat of a discharge.

To proceed with restoration planning, trustees also quantify the degree, and spatial and temporal extent of injuries. Injuries are quantified by comparing the condition of the injured natural resources or services to baseline, as necessary.

1.4.2.2 Restoration Selection

(a) Developing Restoration Alternatives

Once injury assessment is complete or nearly complete, trustees develop a plan for restoring the injured natural resources and services. Under the OPA regulations, trustees must identify a reasonable range of restoration alternatives, evaluate and select the preferred alternative(s), and develop a Draft and Final Restoration Plan. Acceptable restoration actions include any of the actions authorized under OPA (restoration, rehabilitation, replacement, or acquisition of the equivalent) or some combination of those actions

Restoration actions under the OPA regulations are either primary or compensatory. Primary restoration is action taken to return injured natural resources and services to baseline, including natural recovery. Compensatory restoration is action taken to compensate for the interim losses of natural resources and/or services pending recovery. Each restoration alternative considered will contain primary and/or compensatory restoration actions that address one or more specific injuries associated with the incident. The type and scale of compensatory restoration may depend on the nature of the primary restoration action, and the level and rate of recovery of the injured natural resources and/or services given the primary restoration action.

When identifying the compensatory restoration components of the restoration alternatives, trustees must first consider compensatory restoration actions that provide services of the same type and quality, and of comparable value as those lost. If compensatory actions of the same type and quality and comparable value cannot provide a reasonable range of alternatives, trustees then consider other compensatory restoration actions that will provide services of at least comparable type and quality as those lost.

(b) Scaling Restoration Actions

To ensure that a restoration action appropriately addresses the injuries resulting from an incident, trustees must determine what scale of restoration is required to return injured natural resources to baseline levels and compensate for interim losses. The approaches that may be used to determine the appropriate scale of a restoration action are the resource-to-resource (or service-to-service approach) and the valuation approach. Under the resource-to-resource or service-to-service approach to scaling, trustees determine the appropriate quantity of replacement natural resources and/or services to compensate for the amount of injured natural resources or services.

Where trustees must consider actions that provide natural resources and/or services that are of a different type, quality, or value than the injured natural resources and/or services, or where resource-to-resource (or service-to-service) scaling is inappropriate, trustees may use the valuation approach to scaling, in which the value of services to be returned is compared to the value of services lost. Responsible parties (RPs) are liable for the cost of implementing the restoration action that would generate the equivalent value, not for the calculated interim loss in value. An exception to this principle occurs when valuation of the lost services is practicable, but valuation of the replacement natural resources and/or services cannot be performed within a reasonable time frame or at a reasonable cost. In this case, trustees may estimate the dollar value of the lost services and select the scale of the restoration action that has the cost equivalent to the lost value.

(c) Selecting a Preferred Restoration Alternative

The identified restoration alternatives are evaluated based on a number of factors that include:

- Cost to carry out the alternative;
- Extent to which each alternative is expected to meet the trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses;
- Likelihood of success of each alternative;

- Extent to which each alternative will prevent future injury as a result of the incident, and avoid collateral injury as a result of implementing the alternative;

- Extent to which each alternative benefits more than one natural resource and/or service; and

- Effect of each alternative on public health and safety.

Trustees must select the most cost-effective of two or more equally preferable alternatives.

(d) Developing a Restoration Plan

A Draft Restoration Plan will be made available for review and comment by the public, including, where possible, appropriate members of the scientific community. The Draft Restoration Plan will describe the trustees' preassessment activities, as well as injury assessment activities and results, evaluate restoration alternatives, and identify the preferred restoration alternative(s). After reviewing public comments on the Draft Restoration Plan, trustees develop a Final Restoration Plan. The Final Restoration Plan will become the basis of a claim for damages.

1.4.3 Restoration Implementation Phase

The Final Restoration Plan is presented to the RPs to implement or fund the trustees' costs of implementing the Plan, therefore providing the opportunity for settlement of the damage claim without litigation. Should the RPs decide to decline to settle the claim, OPA authorizes trustees to bring a civil action for damages in federal court or to seek an appropriation from the Oil Spill Liability Trust Fund (FUND) for such damages.

1.5 Basic Terms and Definitions

Legal and regulatory language often differ from conventional usage. This section defines and describes a number of important terms used in this document and in the OPA regulations. Trustees should also refer to the OPA regulatory language of Appendix A (at § 990.30), and Appendix C for additional, related definitions.

1.5.1 Baseline

> "*Baseline* means the condition of the natural resources and services that would have existed had the incident not occurred. Baseline data may be estimated using historical data, reference data, control data, or data on incremental changes (e.g., number of dead animals), alone or in combination, as appropriate." (OPA regulations at § 990.30)

Baseline refers to the condition of natural resources and services that would have existed had the incident not occurred. Although injury quantification requires comparison to a baseline condition, site-specific baseline information that accounts for natural variability and confounding factors prior to the incident may not be required. In many cases, injuries can be quantified in terms of incremental changes resulting from the incident, rather than in terms of absolute changes relative to a known baseline. In this context, site-specific baseline information is not necessary to quantify injury. For example, counts of oiled bird carcasses can be used as a basis for quantifying incremental bird mortality resulting from an incident, thereby providing the basis for planning restoration.

The OPA regulations do not distinguish between baseline, historical, reference, or control data in terms of value and utility in determining the degree and spatial and temporal extent of injuries. These forms of data may serve as a basis of a determination of the conditions of the natural resources and services in the absence of the incident.

Types of information that may be useful in evaluating baseline include:

- Information collected on a regular basis and for a period of time from and prior to the incident;
- Information identifying historical patterns or trends on the area of the incident and injured natural resources and services;
- Information from areas unaffected by the incident, that are judged sufficiently similar to the area of the incident with respect to the parameter being measured; or
- Information from the area of the incident after particular natural resources or services have been judged to have recovered.

1.5.2 Exposure

> "*Exposure* means direct or indirect contact with the discharged oil." (OPA regulations at § 990.30)

Exposure is broadly defined to include not only direct physical exposure to oil, but also indirect exposure (e.g., injury to an organism as a result of disruption of its food web). However, documenting exposure is a prerequisite to determining injury only in the event of an actual discharge of oil. The term *exposure* does not apply to response-related injuries and injuries resulting from a substantial threat of a discharge of oil.

1.5.3 Incident

> "*Incident* means any occurrence or series of occurrences having the same origin, involving one or more vessels, facilities, or any combination thereof, resulting in the discharge or substantial threat of discharge of oil into or upon navigable waters or adjoining shorelines or the Exclusive Economic Zone, as defined in section 1001(14) of OPA (33 U.S.C. 2701(14))." (OPA regulations at § 990.30)

When a discharge of oil occurs, natural resources and/or services may be injured by the actual discharge of oil, or response activities related to the discharge. When there is a substantial threat of a discharge of oil, natural resources and/or services may also be injured by the threat or response actions related to the threat.

1.5.4 Injury

> "*Injury* means an observable or measurable adverse change in a natural resource or impairment of a natural resource service. Injury may occur directly or indirectly to a natural resource and/or service. Injury incorporates the terms 'destruction,' 'loss,' and 'loss of use' as provided in OPA." (OPA regulations at § 990.30)

Section 1002(b)(2)(A) of OPA authorizes natural resource trustees to assess damages for "injury to, destruction of, loss of, or loss of use of" natural resources. The definition of *injury* incorporates these terms. The definition also includes the injuries resulting from the actual discharge of oil, a substantial threat of a discharge of oil, and/or related response actions.

Injury can include adverse changes in the chemical or physical quality, or viability of a natural resource (i.e., direct, indirect, delayed, or sublethal effects). Potential categories of injuries include adverse changes in:

- Survival, growth, and reproduction;
- Health, physiology and biological condition;
- Behavior;
- Community composition;
- Ecological processes and functions;
- Physical and chemical habitat quality or structure; and
- Services to the public.

Although injury is often thought of in terms of adverse changes in biota, the definition of injury under the OPA regulations is broader. Injuries to non-living natural resources (e.g., oiled sand on a recreational beach), as well as injuries to natural resource services (e.g., lost use associated with a fisheries closure to prevent harvest of tainted fish, even though the fish themselves may not be injured) may be considered.

1.5.5 Natural Resources and Services

> "*Natural resources* means land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States (including the resources of the Exclusive Economic Zone), any State or local government or Indian tribe, or any foreign government, as defined in section 1001(20) of OPA (33 U.S.C. 2701(20))." (OPA regulations at § 990.30)

Natural resources provide various services to other natural resources and to humans, and loss of services is included in the definition of injury under the OPA regulations.

"*Services* (or *natural resource services*) means the functions performed by a natural resource for the benefit of another natural resource and/or the public." (OPA regulations § 990.30)

Natural resource services may be classified as follows:

- Ecological services - the physical, chemical, or biological functions that one natural resource provides for another. Examples include provision of food, protection from predation, and nesting habitat, among others; and

- Human services - the human uses of natural resources or functions of natural resources that provide value to the public. Examples include fishing, hunting, nature photography, and education, among others.

In considering both natural resources and services, trustees are addressing the physical and biological environment, and the relationship of people with that environment.

1.5.6 Oil

"Oil means oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil. However, the term does not include petroleum, including crude oil or any fraction thereof, that is specifically listed or designated as a hazardous substance under 42 U.S.C. 9601(14)(A) through (F), as defined in section 1001(23) of OPA (33 U.S.C. 2701(23))." (OPA regulations at § 990.30)

Under the OPA regulations, the definition of *oil* includes petroleum, as well as non-petroleum oils (i.e., fats and oils from animal and vegetable sources). However, in assessing injury resulting from non-petroleum oils, trustees should consider the differences in the physical, chemical, biological, and other properties, and in the environmental effects of such oils on the natural resources of concern.

1.5.7 Pathway

"*Pathway* means any link that connects the incident to a natural resource and/or service, and is associated with an actual discharge of oil." (OPA regulations at § 990.30)

Pathway is the medium, mechanism, or route by which the incident has resulted in an injury. Pathways may include movement/exposure through the water surface, water column, sediments, soil, groundwater, air, or biota.

Pathway determination may include, but is not limited to, an evaluation of the sequence of events by which the discharged oil was transported from the incident and either:

- Came into direct physical contact with the exposed natural resource (e.g., oil transported from an incident by ocean currents, wind, and wave action directly to shellfish); or

- Caused an indirect injury to a natural resource and/or service (e.g., oil transported from an incident by ocean currents, wind, and wave action cause reduced populations of bait fish, which in turn results in starvation of a fish-eating bird; or, oil transported from an incident by currents, wind, and wave action causes the closure of a fishery to prevent potentially tainted fish from being marketed).

Pathway determination does not require that injured natural resources and/or services be directly exposed to oil. In the example provided above, fish-eating birds are injured as a result of decreases in food availability. However, if an injury is caused by direct exposure to oil, the pathway linking the incident to the injury should be determined.

As with exposure, establishing a pathway is a prerequisite to determining injury, except for response-related injuries and injuries resulting from a substantial threat of a discharge of oil.